OPTICAL PHENOMENA.

SOLAR HALOS.

Solar halos have been observed in the various districts on the following dates:

New England.—5th to 8th, 13th, 15th, 20th, 23d, 27th.

Middle Atlantic states.—3d, 4th, 5th, 7th, 8th, 10th, 12th, 15th, 17th, 18th, 20th, 23d, 25th, 27th.

South Atlantic states.—5th, 7th, 10th, 11th, 13th, 14th, 16th, 18th, 23d, 24th, 28th, 31st.

Eastern Gulf states.—3d, 4th, 13th, 21st.

Western Gulf states.—2d, 3d, 6th, 9th, 11th, 22d, 26th.

Tennessee.—3d, 13th, 16th, 17th, 27th.

Lower lake region.—4th, 7th, 10th, 12th, 15th, 18th, 22d, 23d, 27th.

Upper lake region.—1st, 2d, 4th, 5th, 7th, 9th to 12th, 15th, 19th, 22d, 25th, 31st.

Extreme northwest.—1st, 3d, 4th, 10th, 11th, 13th, 18th, 30th.

Upper Mississippi valley.—2d to 6th, 9th, 10th, 11th, 13th, 15th, 16th, 17th, 19th, 22d, 24th, 26th, 31st.

Missouri valley.—1st to 5th, 11th, 15th, 17th, 19th, 23d, 26th.

Northern slope—2d to 6th, 10th, 19th.

Middle slope.—1st, 3d, 4th, 5th, 9th, 10th, 16th, 19th, 21st, 25th, 26th, 30th.

South Pacific coast region.—3d, 4th, 6th, 7th, 10th, 18th, 19th, 24th.

Solar halos were also observed at the following statlons not included in the districts named above:

Fort Apache, Arizona, 9th.
Prescott, Arizona, 15th.
Oakland and Sacramemto, California, 7th.
Carson City, Nevada, 18th.
College Hill, Ohio, 9th, 15th.
Roseburg, Oregon, 18th.
Nephi, Utah, 24th.

LUNAR HALOS.

Lunar halos have been observed in the various districts on the following dates:

New England.—4th to 8th, 10th, 12th, 14th to 17th, 31st.

Middle Atlantic states.—3d to 13th, 16th, 17th, 18th, 23d.

South Atlantic states.—2d, 3d, 4th, 6th to 11th, 13th, 14th, 15th

Eastern Gulf states.—4th, 6th, 7th, 9th, 12th.

Western Gulf states.—5th to 13th, 15th.

Tennessee.—3d, 5th, 6th, 9th, 10th, 13th, 14th, 16th, 17th.

Ohio valley.—3d, 6th, 7th, 9th, 11th to 16th, 18th.

Lower lake region.—7th, 11th, 12th, 22d.

Upper lake region.—3d, 4th, 5th, 7th to 12th, 14th to 17th.

Extreme northwest.—2d, 3d, 4th, 7th, 8th, 10th, 11th, 16th, 31st.

Upper Mississippi valley.—3d to 17th, 19th.

Missouri valley.—1st, 3d, 4th, 9th, 10th, 11th, 13th, 14th, 16th, 23d.

Northern slope.—4th, 7th, 8th, 9th, 11th, 13th, 22d.

Middle slope.—4th, 9th, 13th, 16th, 21st.

Southern plateau.—3d, 5th to 10th, 19th, 20th, 22d.

Middle plateau.—4th to 7th, 11th, 13th.

North Pacific coast region.—7th to 11th, 17th.

Middle Pacific coast region.—7th, 9th, 19th.

South Pacific coast region.—5th, 6th, 7th, 19th.

Lunar halos were also observed at the following stations not included in the districts named above:

Cedar Keys, Florida, 3d.
Lewiston, Idaho, 7th.
Brownsville, Texas, 15th.
Fort Davis, Texas, 4th.
Fort Stockton, Texas, 3d.

MIRAGE.

Sussex, Waukesha county, Wisconsin.—At 7 p. m. of the 7th the hills south of Pewaukee lake appeared in inverted positions at an altitude of three hundred feet.

Webster, Day county, Dakota.—On the morning of the 30th distant objects below the horizon were apparently lifted into the range of vision.

Mirage was also observed at the following stations:

Pretty Prairie, Kansas, 2d, 9th, 11th, 12th, 13th, 17th, 21st, 22d, 24th, 28th, 30th.

Genoa, Nebraska, 9th, 12th, 22d, 25th.

Indianola, Texas, 6th, 8th, 9th, 14th.

MISCELLANEOUS PHENOMENA.

The phenomenal sunrises and sunsets, so extensively reported during the previous months, were also observed during January. From the reports received, it appears that, upon the whole, the displays of January were not so brilliant as those of October, November, and December, although some observers report that those occurring in January were the most brilliant seen at any time since the first appearance of the phenomenon. The reports at hand show the general characteristics of the January displays to be the same as those of the past months, heretofore published in the REVIEW.

In the following summary are given, principally, the dates on which the phenomenon was observed in the several states, with brief descriptions of some of the more important displays:

Alabama.—Auburn: red skies on the evenings of the 20th, 21st, 22d.

Mobile: at sunset, and for one hour thereafter, on the 20th, the eastern horizon was of a bright red color, extending upward 35°. In the west the light rose to an altitude of from 60° to 80°. The colors were so bright that the reflection caused white buildings to assume a pink shade. This display was, by far, the most brilliant of the many beautiful sunsets observed during the last three months. The colors in the western sky remained for more than one hour, and then gradually faded away.

Arizona.—Fort Bowie: red sunsets on the 4th and 12th; on the 27th a brilliant, red light remained visible in the western sky for two hours after sunset.

Arkansas.—Lead Hill: the brilliant sunsets observed since September, were also observed on January, 3d, 24th, 28th, and 31st, the displays becoming less brilliant toward the last of the month.

Little Rock: the sky was of lurid color to an altitude of 80° after sunset on the 2d.

Fort Smith, 22d: the western horizon, though partially obscured by the clouds, was illuminated with red, in places. On the morning of the 26th one-fourth of the eastern sky was of a beautiful red color.

California.—Hydesville, Humboldt county: red skies at sunset from the 10th to 17th, 19th, 21st, 23d, 26th, 28th, 29th, 30th; and at sunrise on 12th, 14th to 17th, 22d, 30th. The unusual colors in the sky before sunrise and after sunset continued on the dates given above, the displays on evenings of the 14th and 15th being the brightest.

Fall Brook: bright after-glow on the 12th. On the 13th, while the usual sunset glow was fading, an arc of salmon color formed above it at an altitude of 25°, from which streamers radiated to an altitude of 45°. A band of pale indigo color separated it from the normal sunset glow beneath, giving the display the appearance of the aurora. The arc rapidly moved toward the horizon, and a second arc formed above it at an altitude of 35°, which sent out streamers, pointing downward toward the common centre and nearly meeting those still visible on the lower arc. The phenomenon was of short duration having disappeared twenty minutes after sunset, leaving the western horizon illuminated with a uniform tint which continued for one hour.

Oakland: bright sunrises and sunsets were observed during the entire month.

Los Angeles: bright sunsets, 16th to 19th, 21st, 22d, 23d.

Colorado.—Golden: beautiful, glowing tints were observed in the eastern and western skies before and after sunset during the greater part of the month.